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David B. Minturn

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EXAMINER

CHRISTENSEN, SCOTT B

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/748,415 | Applicant(s) MINTURN, DAVID B. | |
| | Examiner Scott Christensen | Art Unit 2444 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in regards to the most recent papers filed on 6/30/2008.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 6, 7, 10-12, 15-25 & 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Boucher et al. (US Pat. No. 7174393) hereafter "Boucher".

4. Regarding Claim 1, Boucher discloses a network interface controller, comprising: a hashing logic (**Fig. 4C, 32**) **receive logic** to generate a hashing value from a packet received from a network (**Col. 10, lines 21-26**) **a hashing value is generated from the packet received from the network**, the received packet having a context associated therewith; a hash table pages table (**Col. 57, lines 38-43**) **hash table** and a context table pages table (**Col. 47, lines 40-43**) **routing table which contains the IP address** for storing host memory physical page addresses of a host hash table and a host context table, respectively; and a cache line determinator (**Fig. 1, 30**) **CPD**, in communication with the host (**Fig. 1, 20**) **host**, and the hashing logic (**Fig. 4C, 32**) **receive logic**, the cash line determinator (**Fig. 1, 30**) **CPD**, being configured to associate the hash value with a host hash table cache line (**Fig. 4C, 62**) **CCB cache**,

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and a host context table cache line in a host memory (**Col. 15, lines 22-25**) the **information may be saved in the file buffer cache on host 152** using the hash table pages table (**Col. 57, lines 38-43**) **hash table** and the context table pages table (**Col. 47, lines 40-43**) **routing table which contains the IP address**, respectively.

5. Regarding Claim 2, Boucher discloses: the hashing logic is configured to generate the hashing value from the context associated with the received packet (**Col. 10, lines 21-26**) **a hashing value is generated form the packet received form the network.**

6. Regarding Claim 3, Boucher discloses the invention as substantially claimed. Boucher further discloses each entry in the hash table pages table and the context table pages table correspond to a page in the host memory (**Col. 26, line 46-47**) **complete set of TCB's exist in the host memory.**

7. Regarding Claim 6, Boucher discloses the invention as substantially claimed. Boucher further discloses a receive descriptor associated with the received packet and to output the receive descriptor to the host (**Col. 12, lines 39-43**).

8. Regarding Claim 7, Boucher discloses the invention as substantially claimed. Boucher further discloses issuing a pre-fetch of the host context table cache line and the host hash table cache line (**Col. 67, lines 6-12**).

9. Claim 10, lists all the same elements of claim 1, but in method form rather than system form. Therefore, the supporting rationale of the rejection to claim 1 applies equally as well to claim 10.

10. Regarding Claim 11, Boucher discloses the invention as substantially claimed. Boucher further discloses each entry in the hash table pages table and the context table pages table correspond to a page in the host memory **(Col. 26, line 46-47) complete set of TCB's exist in the host memory.**

11. Regarding Claim 15, Boucher discloses the invention as substantially claimed. Boucher further discloses inserting the host context table cache line and the host hash table cache line into a receive descriptor associated with the received packet; and outputting the receive descriptor to the host. **(Col. 12, lines 39-43).**

12. Regarding Claim 16, Boucher discloses the invention as substantially claimed. Boucher further discloses issuing a pre-fetch of the host context table cache line and the host hash table cache line **(Col. 67, lines 6-12).**

13. Claim 17, lists all the same elements of claim 10, but in computer readable medium form rather than method form. Therefore, the supporting rationale of the rejection to claim 10 applies equally as well to claim 17.

14. Claim 20, lists all the same elements of claim 15, but in computer readable medium form. Therefore, the supporting rationale of the rejection to claim 15 applies equally as well to claim 20.

15. Claim 21, lists all the same elements of claim 7, but in computer readable medium form. Therefore, the supporting rationale of the rejection to claim 7 applies equally as well to claim 21.

16. Claim 22, lists all the same elements of claim 1 in system form. Therefore, the supporting rationale of the rejection to claim 1 applies equally as well to claim 10. Boucher further discloses a host CPU (**Fig 1, 28**) CPU, a host memory (**Fig. 1, 35**) **storage**, a network interface card (NIC) (**Fig. 6, 150**) **INIC**; a host bus to facilitate the host cpu, host memory, and the NIC to communicate therebetween (**Fig. 9, 205**) **PCI bus**.

17. Regarding Claim 23, Boucher discloses the invention as substantially claimed. Boucher further discloses issuing a pre-fetch of the host context table cache line and the host hash table cache line (**Col. 67, lines 6-12**).

18. Regarding Claim 24, Boucher discloses the invention as substantially claimed. Boucher further discloses the hashing logic (**Fig. 4C, 32**) **receive logic** is configured to

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generate the hashing value from the context associated with the received packet (**Col. 10, lines 21-26**) a hashing value is generated form the packet received form the network.

19. Regarding Claim 25, Boucher discloses the invention as substantially claimed. Boucher further discloses each entry in the hash table pages table and the context table pages table correspond to a page in the host memory (**Col. 26, line 46-47**) complete set of TCB's exist in the host memory, the host memory being in communication with the network interface controller (**Fig. 1, 35**) storage in communication with (**Fig. 1, 30**) CPD.

20. Regarding Claim 30, Boucher discloses the invention as substantially claimed. Boucher further discloses the network interface controller is configured to issue a pre-fetch of the host context table cache line and the host hash table cache line (**Col. 67, lines 6-12**).

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 4, 5, 8, 9, 13, 14, 26-29 are rejected under 35 U.S.C. 103(a) as being obvious over Boucher in view of Bryg et al. (US Pat. No. 6393544) hereafter "Bryg".

23. Regarding Claim 4, Boucher discloses the invention as substantially claimed. However Boucher does not teach determine the host hash cache line and the host context cache line using the physical address of the hash table page and the context table page and an offset of the hash value within the hash table page and the context table page, respectively.

24. In the same field of endeavor, Bryg teaches, **(Col. 3, lines 27-38) using physical address , and the hash content, a cache line is determined by translation.**

25. It would have been obvious to one of ordinary skill in the networking art at the time the applicant's invention was made to combine Boucher's teachings as discussed above with the teachings of Bryg, for the purpose of **(see BRYG, abstract, lines 32-33)** reducing the amount of logic required to access page tables. Boucher provides motivation to do so, by increasing the speed and efficiency of moving data being communicated from a network **(see Boucher, Col.3, lines 41-44).**

26. Regarding Claim 5, Boucher discloses the invention as substantially claimed. However Boucher does not teach wherein upon initialization, the network interface

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controller is configured with a set number of hash node entries in the hash table of the host memory.

27. In the same field of endeavor, Bryg teaches, **(Col. 4, lines 51-65) during initialization, the hash functions are set to allow virtual to physical translations to proceed quickly.**

28. The same motivation as explained above applies equally as well to claim 5.

29. Regarding Claim 8, Boucher discloses the invention as substantially claimed. Boucher further discloses pre-fetching **(Col. 67, lines 6-12)**. However Boucher does not teach a virtual host hash table cache line and a virtual host context table cache line.

30. In the same field of endeavor, Bryg teaches, **(Col. 3, lines 29-38) virtual host hash and context tables.**

31. The same motivation as explained above applies equally as well to claim 8.

32. Regarding Claim 9, Boucher-Bryg discloses the invention as substantially claimed. Boucher further discloses the hashing logic is configured to generate the hashing value from the context associated with the received packet **(Col. 10, lines 21-26) a hashing value is generated form the packet received form the network.**

33. Claim 13, lists all the same elements of claim 5, but in method form. Therefore, the supporting rationale of the rejection to claim 5 applies equally as well to claim 13.

34. Claim 14, lists all the same elements of claim 5, but in method form. Therefore, the supporting rationale of the rejection to claim 5 applies equally as well to claim 14.

35. Claim 18, lists all the same elements of claim 4, but in computer readable medium form. Therefore, the supporting rationale of the rejection to claim 4 applies equally as well to claim 18.

36. Claim 19, lists all the same elements of claim 4, but in computer readable medium form. Therefore, the supporting rationale of the rejection to claim 4 applies equally as well to claim 19.

37. Claim 26, lists all the same elements of claim 4. Therefore, the supporting rationale of the rejection to claim 4 applies equally as well to claim 26.

38. Claim 27, lists all the same elements of claim 4. Therefore, the supporting rationale of the rejection to claim 4 applies equally as well to claim 27.

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39. Claim 28, lists all the same elements of claim 5. Therefore, the supporting rationale of the rejection to claim 5 applies equally as well to claim 28.

40. Claim 29, lists all the same elements of claim 5, but in method form. Therefore, the supporting rationale of the rejection to claim 5 applies equally as well to claim 29.

Response to Arguments

41. Applicant's arguments filed 6/30/2008 have been fully considered but they are not persuasive.

42. On page 15 of Applicant's arguments, Applicant argues that Boucher does not disclose "using the hash table pages table and the context table pages table," as in claim 1.

It is noted, however, that there is no disclosure within the instant claim that further limits the term "hash" or "hashing." The term "hash" is interpreted as being the utilization of a function to relate items. Thus, it is clear that the term "map" falls within the scope of "hash," where a mapping is likely the simplest version of a hash.

In the case of Boucher, the routing table constitutes a mapping, which, as detailed above, constitutes a hash. Thus, the routing table is a form of a hash table pages table.

Applicant should amend the instant claim to clearly recite what constitutes a "hashing function," what constitutes a "hash table pages table," and what constitutes a "context table pages table."

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43. Further, on page 15, Applicant argues that the Examiner has indicated that the hashing logic is receive logic 32, which is also part of CPD 30, which the Examiner has called the cache line determinator. However, this is irrelevant, as the hashing logic is clearly software, and the cache line determinator may also apparently be directed towards software. As such, even if the two are part of the same program or device, the portions of the logic that perform the claimed functionality are still distinct. Further, the instant claim does not require that the components are separate and distinct (e.g. in different devices). If Applicant intends for the elements of the instant claims to have a particular arrangement, the instant claims should be amended to clearly recite the arrangement.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Christensen whose telephone number is (571)270-1144. The examiner can normally be reached on Monday through Thursday 6:30AM - 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Vaughn can be reached on (571) 272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. C./
Examiner, Art Unit 2444

/William C. Vaughn, Jr./

Supervisory Patent Examiner, Art Unit 2444